REMARKS

Applicant respectfully requests reconsideration of this application as amended. Claims 1-3, 5-11, 13-16, 18-21, 23-27, 30-46, 49-53, 56-60, 62-67, 69-72, and 74-75 remain in this application. Claims 1, 7, 14, 18, 24, 31, 37-43, 50-53, 56, 57, 64-67, 69-72, and 74-75 have been amended. No new claims have been added or canceled.

Rejections under 35 U.S.C. § 101

Claims 37-42, 50-53, 56, 64-67, 69-72, and 74-75 stand rejected under 35 U.S.C. § 101 because the Examiner asserts the claimed invention is directed towards non-statutory subject matter. Applicants have amended the claims to claim a machine readable storage medium. The Office recognizes that a storage medium does not cover a carrier wave. Applicants respectfully submit that claims 37-42, 50-53, 56, 64-67, 69-72, and 74-75 satisfy the requirements of 35 U.S.C. § 101 respectfully requests withdrawal of the rejection to claims 37-42, 50-53, 56, 64-67, 69-72, and 74-75 under 35 U.S.C. § 101.

Rejections under 35 U.S.C. § 112

The Examiner rejected claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56, and 71-72 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant respectfully submits that claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56, and 71-72, as amended, overcome this rejection. Applicant respectfully requests the withdrawal of this rejection.

Rejections under 35 U.S.C. § 103(a)

The Office Action rejected claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56, and 71-72 under 35 U.S.C. § 103(a) as being unpatentable over Golmie

et al., "A Differentiated Optical Services Model for WDM Networks" (hereinafter "Golmie") in view of Jukan et al., "Constraint-based Path Selection Methods for On-demand Provisioning in WDM Networks", IEEE INFOCOM 2002, 23-27 June 2002 and Desnoyers et al., U.S. Patent 6,791,948. Applicant does not admit that either Jukan or Desnoyers is prior art and reserves the right to swear behind either reference at a later date. Nonetheless, Applicant respectfully submits that the combination does not teach each and every element of the invention as claimed in claim 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56, and 71-72.

Golmie describes "a QoS service model in the optical domain … based on a set of optical parameters that captures the quality and reliability of the optical lightpath." (Golmie, Abstract and Table 1.) An optical lightpath being "an optical communication channel, traversing one or more optical links, between a source-destination pair." (Golmie, Page 69, Left column.) Golmie classifies lightpaths (not wavelengths or paths) based on QoS and these classes for example "consist[] of three alternate lightpaths between a single source-destination pair accessible at the WADM, each with a unique DoS class, labeled class 1, class 2, and class 3, containing wavelength groups (λ_1, λ_2), (λ_3, λ_4), and (λ_5, λ_6) respectively… All lightpaths in a DoS class have equivalent quality of optical service between a source-destination pair." (Golmie, page 72, Left column.) Golmie does not describe determining service level topologies. (See Office Action, page 3.).

Jukan discloses flood based path allocation for dynamic routing and wavelength allocation in optical networks based on wavelength dense multiplexing (Jukan, Abstract). Path allocation involves selecting the best path from a source node to a destination node and allocating the selected path (Jukan, p. 832, 1st column). The path selection incorporates service-specific path quality attributes, such as physical layer impairments, reliability, policy, and traffic conditions (Jukan, Abstract). A node gathers state information about possible paths from the source node to the one destination node by

flooding probe messages to each and every node in the network (Jukan, p. 831, 1st column). Each probe message includes a source node ID, destination node ID, and an initial path sequence (Jukan, p. 831, 2nd column). Each node other than the destination node receives the probe message, adds unallocated wavelength information to the probe messages, and forwards the updated probe message to neighbor nodes that have not received the probe message (Jukan, p. 831, 2nd column – p. 832, 1st column). The destination node receives the updated probe messages and selects the best path (Jukan, p. 832, 1st column). The destination node sends an acknowledge message back to the source node along the selected best path for the purpose of resource allocation along the selected path (Jukan, p. 832, 1st column). Furthermore, Jukan discloses that this flood based path allocation is inefficient because the number of necessary message updates scales as $N!$, with N being the number of nodes in the network (Jukan, p. 832, 1st column).

Desnoyers discloses computers that discover a computer network topology, in a network comprising computers and switching nodes in an electrically switched network (Desnoyers, Abstract). The computers, but not the switching nodes, determine the network topology in an iterative fashion by sending out identification request messages specifically to different other computers and switches in the network (Desnoyers, Col. 5, lines 10-20). Each newly discovered switch responds with an identification response message identifying the port the identification request message was received on (Desnoyers, Col. 6, lines 48-53). The requesting computer uses the received responses to generate network topology information (Desnoyers, Col. 5, lines 3-9).

In addition, Desnoyers discloses that the computers should build the network topology information because the switching nodes do not have the requisite processing and storage resources to determine and store a network topology (Desnoyers, Col. 2, lines 39-50).

Furthermore, Desnoyers discloses that the network topology information comprises "the group of switching nodes comprising the network, the pattern of

communication links 13(p) interconnecting the switching nodes 11(n), and the pattern of communication links interconnecting the switching nodes and respective ones of the computers 12(m)" (Desnoyers, Col. 4, line 66 – Col. 5, line 3). Desnoyers does not disclose the structure of the network topology database.

Thus, the combination of Golmie, Jukan, and Desnoyers is a QoS service model in the optical domain based on a set of optical parameters that captures the quality and reliability of an optical lightpath (not paths and wavelengths individually), using a messaging system to discover paths between one source-destination pair, and having remote computers discover the electrically switched network topology.

Thus, this combination does not describe claim 1, as amended:

A method comprising:

creating a plurality of separate service levels by applying a set of one or more connectivity constraints that include quality of service (QoS) based criteria on a physical network topology of a wave length division multiplexing optical network to divide said optical network into said plurality of separate service levels, wherein the connectivity constraints are based on a conversion criteria;

determining service level topologies for each of said plurality of separate service levels for each of a plurality of access nodes in the optical network, wherein each service level topology is a network topology smaller than an entire network topology of the optical network and said each service level topology comprises end to end paths satisfying the corresponding service level from that access node to all other reachable access nodes in said optical network as destinations, wherein an end to end path between two access nodes is the set of one or more links and available wavelengths on that end to end path between the two access nodes, wherein allocated and unallocated wavelengths are considered available wavelengths; and

storing the plurality of service level topologies in a service level connectivity database for each access node and on that access node, wherein the service level connectivity database includes a service level topology structure for each of the plurality of service level topologies and each service level topology structure references the end to end paths for that access node satisfying the corresponding service level, wherein each of the set of end to end paths for that service level references a set of links satisfying that service level on that possible end to end path, wherein the

set of links references available wavelengths for that possible end to end path satisfying that service level.

(Claim 1, as amended) As stated in the Office Action, the Examiner admits that Golmie does not teach or suggest determining service level topologies. (Office Action, Page 3.) The Examiner asserts that because Jukan discloses distributed discovery of wavelength paths, the combination of Jukan and Golmie discloses determining service level topologies. Applicant respectfully disagrees. Jukan discloses discovering paths between a single source destination pair. However, Jukan does not disclose "determining service level topologies … said each service level topology comprises end to end paths satisfying the corresponding service level from that access node to all other reachable access nodes in said optical network as destinations." Furthermore, because Desnoyers does not teach or suggest service levels, Desnoyers cannot teach or suggest the claim element. Thus, none of Golmie, Jukan, or Desnoyers teaches or suggests "determining service level topologies … said each service level topology comprises end to end paths satisfying the corresponding service level from that access node to all other reachable access nodes in said optical network as destinations."

Furthermore, none of Golmie, Jukan, or Desnoyers discloses the structure of a network topology database. In the Office Action, the Examiner did not address Applicant's latest amendments and has not demonstrated how any of Golmie, Jukan, or Desnoyers teaches or suggests a particular structure for service level topologies stored in a service level connectivity database.

Therefore, none of Golmie, Jukan, or Desnoyers teach or suggest "storing the plurality of service level topologies in a service level connectivity database for each access node and on that access node, wherein the service level connectivity database includes a service level topology structure for each of the plurality of service level topologies and each service level topology structure references the end to end paths for that access node satisfying the corresponding service level, wherein each of the set of end

to end paths for that service level references a set of links satisfying that service level on that possible end to end path, wherein the set of links references available wavelengths for that possible end to end path satisfying that service level."

In addition, storing service level topology structures that references a set of end to end paths satisfying the corresponding service level is not obvious to one of skill in the art. In order to support an obvious rejection, the Examiner must show that the difference between the prior art cited and the claimed invention would have been obvious to one of skill in the art (Fed. Reg. Vol. 72, No. 195, p. 57528). One example of one of skill in the art can be found in the well-known Open Shortest Path First (OSPF) protocol. OSPF databases and Shortest Path First (SPF) trees that are not portioned into separate structures based on service level. It should be noted that the since OSPF is a protocol typically used in optically networking to create topology databases, Moy would be considered one of skill in the art. Furthermore, even though it may have known at the time of Moy that a database may be organized in a different fashion, Moy (and others who use OSPF) chose to organize the topology database as a link/lambda state database and/or a link/lambda SPF tree, instead of a topology database with partitioned based on service level. Thus, because Moy organized the OSPF database(s) differently than Applicant's topology database and Moy is one of skill in the art, it would not have been obvious to one of skill in the art to try to store separate service level topology structures that reference a set of end to end paths satisfying the corresponding service level.

The above quoted limitations are not described or suggested by Golmie, Jukan, or Desnoyers. While there are various uses for the invention as claimed, several such uses are discussed in Figure 4 and paragraphs 71-72. Thus, while the invention is not limited to the uses discussed on these pages, it should be understood that Golmie, Jukan, and/or Desnoyers do not enable these uses and the above quoted limitations do.

Accordingly, the combination of Golmie, Jukan, and Desnoyers does not describe what Applicants' claims 1, 7, 14, 18, 24, 31, 37, 43, 50, and 71 require. Claims 2-3, 5-6,

8, 15, 19-20, 23, 25-27, 32, 34-36, 38, 40-42, 44-46, 49, 51-53, 56, and 72 are dependent upon independent claims 1, 7, 14, 18, 24, 31, 37, 43, 50, and 71 and are therefore allowable for at least the same reason.

The Office Action rejected claims 30, 57-60, 62-67, and 69-70 under 35 U.S.C. § 103(a) as being unpatentable over Golmie, Jukan, and Desnoyers in view of Melaku et al., US Patent Publication No. 2003/0074443 (hereinafter "Melaku").

Melaku describes rerouting traffic to a different path based on a change in QoS requirements. (Melaku, Paragraph 0056.) "If the user decides to change QoS requirements in the midst of a session, the LMQB [Last Mile QoS Broker] dynamically updates the database [of the LMQB] and re-allocates new resources and establishes a path that meets the requested quality of service." (Melaku, Paragraph 0056.)

The combination of Golmie, Jukan, Desnoyers, and Melaku does not describe what Applicants require in independent claims 57 or 64. Because Melaku is directed to a QoS broker, Melaku does not teach or suggest service level topologies. As per above, neither do Golmie, Jukan, or Desnoyers.

For example, claim 57, as amended, requires "<u>establishing different service level topologies for a source node of an wavelength division multiplexing optical network in separate service level topology structures, wherein each separate service level topology references a set of communication paths satisfying the corresponding service level</u> ... selecting one of the communication paths and a wavelength on that path using <u>a database that stores, for each of the plurality of service levels, the separate service level topology structures.</u>"

Claim 64, as amended, requires "<u>establishing different service level topologies for a source node of an wavelength division multiplexing optical network in separate service level topology structures</u>, wherein <u>each separate service level topology references a set of communication paths satisfying the corresponding service level</u>, wherein <u>each of the set of communication paths for that service level references a set of links satisfying that service level on that communication path</u>, wherein <u>the set of links references available wavelengths for that communication path satisfying that service level</u>, wherein a communication path between two access nodes is the set of one or more links and

available wavelengths on that communication path between the two access nodes, wherein allocated and unallocated wavelengths are considered available wavelengths"

Accordingly, the combination of Golmie, Jukan, Desnoyers and Melaku does not describe what Applicants require in claims 57 and 64. Claims 30, 58-60, 62-63, 65-67, and 69-70 are dependent upon independent claims 24, 57, and 64 and are therefore allowable for at least the same reason.

CHARGE OUR DEPOSIT ACCOUNT

Please charge any shortage in connection with this communication to our Deposit Account No. 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

Date: September 11, 2008

Eric S. Replogle
Reg. No. 52,161

1279 Oakmead Parkway
Sunnyvale, CA 94085-4040
(408) 720-8300